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Team Test Problems

Bali, May 26-31, 2006

Instructions:

* Ten minute discussion in the beginning to distribute problems to team members.
* No more discussion or exchange of problems allowed after the ten-minute discussion.
* Each student must solve at least one problem.
* Write down your team name on the sheet.
* Write only your answer in the box on the sheet. No explanation is needed.
* After 10-minute discussion, you have 50 minutes to work on this test.

Name : .....
Team : .....
Country : .....

1. Four different natural numbers, all larger than 3, are placed in the four boxes below.

$$\square + \square + \square + \square = 27$$

The four numbers are arranged from the smallest to the largest. How many different ways can we fill the four boxes?

Answer :

Name : .....
Team : .....
Country : .....

2. The number 22 has the following property: the sum of its digits is equal to the product of its digits. Find the smallest 8-digit natural number that satisfies the given condition.

Answer :

Name : .....
Team : .....
Country : .....

3. A number X consists of 4 non-zero digits. A number Y is obtained from X reversing the order of its digits. If the sum of X and Y is 14773 and the difference between them is 3177, determine the larger of these two numbers.

Answer :

Name : .....
Team : .....
Country : .....

4. $ABCD$ is a parallelogram. $P, Q, R,$ and S are points on the sides AB, BC, CD and DA respectively so that $AP = DR$. The area of parallelogram $ABCD$ is 16 cm^2. Find the area of the quadrilateral $PQRS$.

Answer : ☐ **cm**^{2}

Name : .....
Team : .....
Country : .....

5. Adi has written a number of mathematical exams. In order to obtain an overall average of 90 points/percentage, he needed to score 100 points/percentage in the final exam. Unfortunately, he achieved only 75 points/percentage in the final exam, resulting in an overall average of 85 points/percentage. How many exams did he write altogether?

Answer :

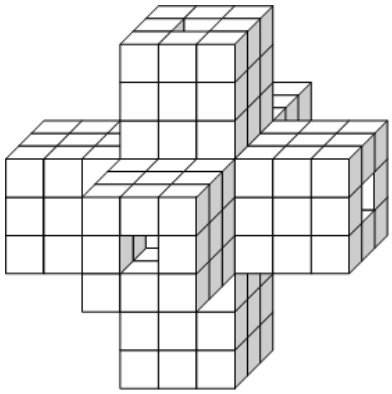
Name : .....
Team : .....
Country : .....

6. Annisa used 120 unit cubes to make a parallelepiped (rectangular prism). She painted all six faces of the parallelepiped. Once the paint had dried, she disassembled the cubes and found that 24 of the cubes had not been painted on any face. What is the surface area of the parallelepiped?

Answer : _____ **square unit**

Name : .....
Team : .....
Country : .....

7. A number of unit cubes are arranged to build a tower-like shape as shown in the figure below. Note that there is a hole across from the left to the right, from the top to the bottom, and from the front to the back. How many unit cubes are there altogether?



Answer :

Name : .....
Team : .....
Country : .....

8. When 31513 and 34369 are divided by the same three-digit number, the remainders are equal.
   What is the remainder?

Answer :

Name : .....
Team : .....
Country : .....

9. Place any four digits from 1 to 5 in a 2×2 square so that:

   (a) in the same row, the digit on the left is greater than that on the right, and

   (b) in the same column, the digit in the top is greater than that at the bottom.

   The diagrams below show two different ways of arranging the digits. How many different ways are there in total?

5	**3**
4	**2**

EXAMPLE 1

5	**3**
2	**1**

EXAMPLE 2

Answer :

Name : .....
Team : .....
Country : .....

10. Peter uses a remote control to move his robot. The remote control has 3 buttons on it. One button moves the robot 1 step forward, another button moves it 2 steps forward and the third button moves it 3 steps forward. How many different ways are possible to move the robot 8 steps forward?

Answer :